

What is claimed is:

1. An organic electroluminescence element comprising, on a substrate:

- an anode which acts as a hole injection electrode;
- a cathode which acts as an electron injection electrode;
- a plurality of light emission layers each having a light

emission region; and

- a charge generation layer which injects electrons into a light emission layer arranged close to said anode and holes into a light emission layer arranged close to said cathode, and said light emission layers and said charge generation layer being arranged between said anode and said cathode;

wherein the work function of said charge generation layer is configured higher than the ionization potential of said light emission layer arranged close to said anode.

2. An organic electroluminescence element comprising, on a substrate:

- an anode which acts as a hole injection electrode;
- a cathode which acts as an electron injection electrode;
- a plurality of light emission layers each having a light

emission region; and

- a charge generation layer which injects electrons into a light emission layer arranged close to said anode and holes into a light emission layer arranged close to said cathode,

and said light emission layers and said charge generation layer being arranged between said anode and said cathode;

wherein the electron affinity of said charge generation layer is configured lower than the electron affinity of the light emission layer arranged close to said anode, and

wherein the ionization potential of said charge generation layer is configured higher than the ionization potential of the light emission layer arranged close to said cathode.

3. An organic electroluminescence element comprising, on a substrate;

an anode which acts as a hole injection electrode;

a cathode which acts as an electron injection electrode;

a plurality of light emission layers each having a light emission region; and

a charge generation layer which injects electrons into a light emission layer arranged close to said anode and holes into a light emission layer arranged close to said cathode, and said light emission layers and said charge generation layer being arranged between said anode and said cathode,

wherein the potential difference between the electron affinity of the light emission layer arranged close to said anode and the electron affinity of said charge generation layer, and the potential difference between the ionization potential

of the light emission layer arranged close to said anode and the ionization potential of said charge generation layer are both configured 0.6 eV or less.

4. An organic electroluminescence element set forth in Claim 1, in which said charge generation layer comprises at least a first generation layer lying in the side of the light emission layer arranged close to said anode and a second generation layer lying in the side of the light emission layer arranged close to said cathode,

wherein said first generation layer is configured at a lower electron affinity compared to that of said second generation layer, and said second generation layer is configured at a higher ionization potential compared to that of said first generation layer.

5. An organic electroluminescence element set forth in Claim 4, wherein the generation layer which is first fabricated is prepared by resistive heating.

6. An organic electroluminescence element set forth in Claim 1, wherein said charge generation layer is made of a dielectric material and the relative permittivity of said charge generation layer is larger than that of said light emission layer.

7. An organic electroluminescence element set forth in Claim 1, wherein the light emission layer arranged close to said anode and the light emission layer arranged close to said cathode are made of the same material mutually.

8. An organic electroluminescence element comprising:  
an anode which acts as a hole injection electrode;  
a cathode which acts as an electron injection electrode;  
and  
a plurality of light emission layers each having a light emission region and fabricated between said anode and said cathode with intervening buffer layers made of a wide gap semiconductor.

9. An organic electroluminescence element set forth in Claim 1 to 8, wherein any of organic thin film layers constituted by the light emission layer or a hole transport layer or an electron transport layer which is formed on the light emission layer if necessary, and provided in contact with the charge generation layer on the substrate side is formed by a polymer material.

10. A organic electroluminescence unit according to claim 1, wherein all organic thin film layers constituted by the light emission layer or a hole transport layer or an electron transport

layer which is provided on the light emission layer if necessary are formed by a polymer material.

11. An organic electroluminescence element set forth in Claim 1, wherein said charge generation layers comprise a high polymer-based organic film.

12. An organic electroluminescence element set forth in Claim 1, wherein the organic thin film layer and the charge generation layer are fabricated by a film-forming method based on a wet process.

13. An organic electroluminescence element set forth in Claim 1, wherein the drying temperature for the organic thin film layer arranged close to said cathode is one not exceeding the glass transition temperature of the light emission layer arranged close to said anode.

14. An exposure unit which uses the organic electroluminescence element set forth in Claim 1 as the light source.

15. An exposure unit which uses an organic electroluminescence element as the light source, said element comprising, on a substrate:

an anode which acts as a hole injection electrode;  
a cathode which acts as an electron injection electrode;  
a plurality of light emission layers each having a light emission region; and

a charge generation layer which injects electrons into a light emission layer arranged close to said anode and holes into a light emission layer arranged close to said cathode, and said light emission layers and said charge generation layer being arranged between said anode and said cathode.

16. An exposure unit set forth in Claim 15,

wherein a light emission layer arranged close to said anode and a light emission layer arranged close to said cathode are made of the same material.

17. An exposure unit set forth in Claim 15,

wherein the layer that includes said light emission layers arranged between said first fabricated electrode and said charge generation layer and that is arranged adjacent to said charge generation layer is made of a high polymer material.

18. An exposure unit set forth in Claim 15, wherein the unit comprises a waveguide the end plane of which in the sub-scanning direction is configured as the light emerging plane, and the light which emits from said organic electroluminescence element,

incident on said waveguide, and emerges from said light emerging plane as the exposure light.

19. An exposure unit set forth in Claim 18, wherein a plurality of said waveguides optically isolated from each other are arranged for each pixel in parallelism along the sub-scanning direction to each other.

20. An exposure unit set forth in Claim 15, wherein said waveguide comprises:

a core having a specified refractive index; and:

a clad that is formed around the outer periphery of said core and has a refractive index smaller than that of said core.

21. An exposure unit set forth in Claim 20, wherein said core has a refractive index smaller than that of said light emission layers.

22. An exposure unit set forth in Claim 20, wherein the refractive index of said core is larger than the value obtained by subtracting 0.3 from the refractive index of said light emission layer.

23. An exposure unit set forth in Claim 18, wherein a light-shielding layer or a light reflection layer is provided

between each of said waveguides adjacent to each other.

24. An exposure unit set forth in Claim 18, wherein said light emerging plane has a shape corresponding to the shape of the pixel.

25. An exposure unit set forth in Claim 18, wherein, in said waveguide, an angle conversion unit is formed that converts the angle of the light impinging on said waveguide from said light emission layer to guide to said light emerging plane.

26. An exposure unit set forth in Claim 25, wherein said angle conversion unit guides the light in the directions other than the sub-scanning direction to said light emerging plane.

27. An exposure unit set forth in Claim 25, wherein said angle conversion unit conducts angle conversion for the direction perpendicular to both of the main and sub-scanning directions to guide the light to said light emerging plane.

28. An exposure unit set forth in Claim 25, wherein said angle conversion unit is formed at the interface between said core and clad located at the opposite side of said light emission layer.



29. An exposure unit set forth in Claim 18, wherein a reflection layer is formed at least either on the plane facing said light emerging plane or on the plane of said waveguide located at the side opposite to said light emission layer.

30. An exposure unit set forth in Claim 18, wherein said light emerging plane is provided with means for diffusion suppression that suppresses the diffusion of the light emerged from said light emerging plane.

31. An exposure unit set forth in Claim 18, wherein the light emerged from said light emerging plane focuses on the photoreceptor as an erect image of an actual size.

32. An exposure unit set forth in Claim 15, wherein the organic electroluminescence element is driven by alternating current, alternating voltage or wave pulse.

33. An exposure unit set forth in Claim 15, wherein the organic electroluminescence element is applied a negative voltage between said anode and said cathode during the period of no light emission.

34. An image-forming apparatus comprising:

the exposure unit set forth in Claim 15; and

a photoreceptor in which an electrostatic latent image is formed by means of said exposure unit.

35. An image-forming apparatus comprising:  
the exposure unit set forth in Claim 15; and  
a photoreceptor in which an electrostatic latent image is formed by means of said exposure unit.

36. An exposure unit utilizing, as the light source, an organic electroluminescence element comprising, provided on a substrate, a plurality of anodes which act as hole injection electrodes and a plurality of cathodes which are arranged alternately with said anodes and act as electron injection electrodes, and a plurality of light emission layers each having a light emission region and arranged between said anode and said cathode.

37. An exposure unit set forth in Claim 36, wherein the layers that include said light emission layer arranged between said first fabricated electrode and said next fabricated electrode is made of a high polymer material.

38. An exposure unit comprising on a substrate at least an organic electroluminescence element acting as a light source; and a waveguide in which the end plane in the sub-scanning

direction is configured as the light-emerging plane, in which the light emitted from said organic electroluminescence element, incident on said waveguide, and emerges from said light-emerging plane, is used as the exposure light,

wherein said organic electroluminescence element comprises at least:

an anode which acts as a hole injection electrode;

a cathode which acts as an electron injection electrode;

and a light emission layer having a light emission region and arranged between said anode and said cathode;

wherein the thickness of said light emission layer is configured thicker than that of said electrodes.

39. An exposure unit comprising at least an organic electroluminescence element acting as a light source, and a waveguide in which the end plane in the sub-scanning direction is configured as the light emerging plane, in which the light, which is emitted from said organic electroluminescence element, is incident on said waveguide, and emerges from said light emerging plane, is used as the exposure light,

wherein said organic electroluminescence element comprises at least:

a plurality of anodes acting as hole injection electrodes;

a plurality of cathodes arranged alternately with said anodes and acting as electron injection electrodes; and

a plurality of light emission layers each arranged between said anode and said cathode and having a light emission region defined by the anode and cathode.